U.S. National Report to ICCAT, 2003

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1. NATIONAL FISHERIES INFORMATION

Total (preliminary) reported U.S. catch of tuna and tuna-like fishes (including swordfish, but excluding other billfishes) in 2002 was 17,793 MT, a decrease of about 28% from 26,384 MT in 2001. However, reported U.S. catches of king mackerel and spanish mackerel include only estimates for the period January-April and January-May, 2002, respectively. Estimated swordfish catch (including estimated dead discards) increased 39 MT to 2,715 MT, and provisional landings from the U.S. fishery for yellowfin in the Gulf of Mexico increased in 2002 to 2,333 MT from 2,045 MT in 2001. The estimated 2002 Gulf of Mexico landings of yellowfin tuna accounted for about 40% of the estimated total U.S. yellowfin landings in 2002. U.S. vessels fishing in the northwest Atlantic landed an estimated 1,913 MT of bluefin, an increase of 299 MT compared to 2001. Provisional skipjack landings increased by 21 MT to 90 MT from 2001 to 2002, estimated bigeye landings decreased by 529 MT compared to 2001 to an estimated 575 MT in 2002, and estimated albacore landings increased from 2001 to 2002 by 175 MT to 499 MT.

2. STATISTICS AND RESEARCH

In addition to monitoring landings and size of swordfish, bluefin tuna, yellowfin tuna, billfish, and other large pelagic species through continued port and tournament sampling, logbook and dealer reporting procedures, and scientific observer sampling of the U.S. fleet, major research activities in 2002 and 2003 focused on several items. Research on development of methodologies to identify genetically discrete populations of large pelagic fishes in the Atlantic was continued as were larval surveys for bluefin tuna and other large pelagics in the Gulf of Mexico. Research on development of robust estimation techniques for population analyses and on approaches for characterization of uncertainty in assessments and methods for translating that uncertainty into risk levels associated with alternative management approaches was further conducted. U.S. scientists also continued to coordinate efforts for the ICCAT Enhanced Research Program for Billfish and for the Bluefin Year Program. Participants in the Southeast Fisheries Science Center's Cooperative Tagging Center (CTC) and the Billfish Foundation tagging program tagged and released 8,489 billfishes (swordfish, marlins, sailfish, and spearfish) and 664 tunas in 2002. This represents an increase of 9% for billfish and a 34% increase for tunas from 2001 levels. Electronic tagging studies of bluefin tuna and of marlins were substantially enhanced. Cooperative research was conducted with scientists from other nations on development of assessment methodologies, on biological investigations and on development of indices of abundance for species of concern to ICCAT.

2.1 Fisheries Statistics

2.1.1 Tropical Tuna Fishery Statistics

Yellowfin Tuna. Yellowfin is the principal species of tropical tuna landed by U.S. fisheries in the western North Atlantic. Total estimated landings decreased to 5,845 MT in 2002, from the 2001 landings estimate of 6,703 MT (Appendix Table 2.1-YFT). The 2002 estimate is considered provisional and may change owing to incorporation of late reports of commercial catches as they become available and to possible revisions in estimates of rod & reel catches made by recreational anglers. A high proportion of the landings were due to estimated rod & reel catches of recreational anglers in the NW Atlantic (2,878 MT). Estimates of U.S. recreational harvests for tuna and tuna-like species continue to be reviewed. Therefore future revisions of these estimates may be necessary. Nominal catch rate information from logbook reports (longline catch per 1,000 hooks) for yellowfin by general fishing areas is shown in Appendix Figure 2.1-YFT.

Skipjack Tuna. Skipjack tuna also are caught by U.S. vessels in the western North Atlantic. Total reported skipjack landings (preliminary) increased from 69 MT in 2001 to 90 MT in 2002 (Appendix Table 2.1-SKJ). The largest increase in catch was in the estimates for the recreational fishery in the Caribbean (Area 93). Estimates of recreational harvests of skipjack continue to be reviewed and could be revised again in the future. Appendix Figure 2.1-SKJ presents nominal catch rate information (longline catch per 1,000 hooks) based on fishing logbook reports.

Bigeye Tuna. The other large tropical tuna reported in catches by U.S. vessels in the western North Atlantic is bigeye tuna. Total reported catches and landings (preliminary) for 2002 decreased by 52% from 1104 MT in 2001 to 575 MT (Appendix Table 2.1-BET). Note that like yellowfin, the estimates of rod & reel catch are considered provisional and may be revised based on results of a future review of recreational harvest estimates. Appendix Figure 2.1-BET presents nominal catch rate information (longline catch per 1,000 hooks) based on fishing logbook reports.

2.1.2   Temperate Tuna Fishery Statistics

Bluefin Tuna. The U.S. bluefin fishery continues to be regulated by quotas, seasons, gear restrictions, limits on catches per trip, and size limits. To varying degrees, these regulations are designed to restrict total U.S. landings and to conform to ICCAT recommendations. U.S. vessels fishing in the northwest Atlantic (including the Gulf of Mexico) in 2002 landed an estimated 1,875 MT of bluefin tuna. Those estimated landings represent an increase of 292 MT from the 2001 landings. The 2002 landings by gear were: 208 MT by purse seine, 55 MT by harpoon, 4 MT by handline, 50 MT by longline (of which 20 33 MT were from the Gulf of Mexico), 1,557 MT by rod and reel (of which, 548 MT was the preliminary estimate for bluefin less than 145cm SFL from off the northeastern U.S.).

Regulations limit the allowable catch of small fish by U.S. fishermen in conformity with ICCAT recommendations. The preliminary landing estimates for the 2002 rod and reel fishery off the northeastern U.S. (including the North Carolina winter fishery) for fish < 66 cm were 559 fish totaling 2 MT; estimates for fish between 66-114 cm were 13,245 fish totaling 168 MT. Regulations also prohibit the sale of fish less than 178 cm; an estimated 1926 fish 145-177 cm (122 MT) were primarily landed by recreational anglers using rod and reel. For longline gear, logbook tallies of dead discarded bluefin for 2002 amount to 301 fish which were estimated to weigh 38 MT.

Albacore. Albacore are landed by U.S. vessels; however, historically, albacore has not been a main focus of the U.S. commercial tuna fisheries operating in the North Atlantic. Reported commercial catches were relatively low prior to 1986; however, these catches increased substantially and have remained at higher levels throughout the 1990s, with nearly all of the production coming from the northeastern U.S. coast. Caribbean landings increased in 1995 to make up over 14% of the total, but U.S.

landings from the Caribbean have remained below 4% of the total each year during 1996-2002. Nominal catch rate information from U.S. longline logbook reports are shown in Appendix Figure 2.1-ALB. Estimated total catches of albacore were 499 MT in 2002, an increase of 175 MT from 2001 which was primarily due to an increase in estimated rod and reel catches from 122 MT in 2001 to 342 MT in 2002 (Appendix Table 2.2-ALB).

2.1.3   Swordfish Fishery Statistics

For 2002 the provisional estimate of U.S. vessel landings and longline dead discards of swordfish was 2,709 MT (Appendix Table 2.3-SWO). This estimate is larger than the estimate of 2,656 MT for 2001. The provisional landings, excluding discard estimates, by ICCAT area for 2002 (compared to 2001) were: 556MT (426 MT) from the Gulf of Mexico (Area 91); 1,187 MT (1,040MT) from the northwest Atlantic (Area 92); 325 MT (347 MT) from the Caribbean Sea (Area 93); and 593 MT (402 MT) from the North Central Atlantic (Area 94A), and 54 MT (149 MT) from the SW Atlantic (Area 96).

U.S. swordfish landings are monitored in-season from reports submitted by dealers, vessel owners and captains, NMFS port agents, and mandatory daily logbook reports submitted by U.S. vessels permitted to fish for swordfish. This fishery is also being monitored via a scientific observer sampling program, instituted in 1992. Approximately 5% of the longline fleet-wide fishing effort is randomly selected for observation during the fishing year. The observer sampling data, in combination with logbook reported effort levels, support estimates of approximately 24,800 fish discarded dead in 2002. For the North Atlantic, the estimated tonnage discarded dead in 2002 is 261 MT, of which 240 is estimated due to longline gear. Overall, the estimates of dead discarded catch declined by 15% (45 MT) compared to the 2001 level. These are thought to in large part be due to the effects of time-area closures and other domestic management actions in place during 2002 (see Appendix).

Total weight of swordfish sampled for sizing U.S. landings by longline, harpoon, otter trawl, and handline were 2,286 MT, 3 MT, 0.4 MT, and 7 MT in 2002, respectively. The weight of sampled swordfish landings in 2002 represented substantial percentages of to total landings: longline 98%, harpoon 100%, otter trawl 10%, and handline 69%. Again, incorporation of late reports into the estimated 2002 landings figure will likely result in changes in the sampled fraction of the catch. Recent estimates of rod and reel landings of swordfish based on statistical surveys of recreational anglers, range from about 5-48 MT per year for the period 1996-2002.

2.1.4   Marlins and Sailfish Fishery Statistics

Blue marlin, white marlin, and sailfish are landed by U.S recreational rod and reel fishermen and are a discarded by-catch of the U.S. commercial tuna and swordfish longline fisheries. The U.S. Fisheries Management Plan for Atlantic Billfishes was implemented in October, 1988. The Plan allows billfish that are caught by recreational gear (rod and reel) to be landed only if the fish is larger than the minimum size specified for each species covered by the Plan. Recreational landings of each billfish species can be estimated using: (a) the SEFSC Recreational Billfish Survey (RBS) which provides the number of billfish caught during tournaments held along the southeastern U.S. coast (south of 35^0 N latitude), in the Gulf of Mexico, and U.S. Caribbean Sea regions (i.e., U.S. Virgin Islands and Puerto Rico); (b) the Large Pelagics Recreational Survey (LPS) conducted by the National Marine Fisheries Service which provides estimates of recreational billfish harvest from waters along the northeastern U.S. (north of 35° N latitude); (c)Marine Recreational Fishery Statistics Survey (MRFSS); (d) a Headboat survey (large multi-party charter boats); and/or (e) a coastal sportfishing survey of the Texas recreational fishery (TPW). Studies conducted indicate that use of a time-series running average from the US general marine

recreational fishing survey (MRFSS) in combination with data from the RBS or other surveys may provide the most reliable estimates of overall recreational catch and landings for marlins. These methods have been applied for white marline and sailfish.

Two recent ICCAT papers (i.e., SCRS/2000/057 and SCRS/02/074) report the US recreational harvest of Atlantic blue marlin and white marlin as well as the methodologies used to arrive at these estimates. Annual white marlin and blue marlin recreational harvest estimates for the years 1960 through 1999 are presented in SCRS/2000/057. Estimates for white marlin (only) were then updated through 2001 in SCRS/02/074. From the year 1981 forward, a ratio-based estimation process is employed using data from the RBS and the MRFSS. The RBS is assumed to be accurate, but limited in scope because it covers only tournament landings. Conversely, the MRFSS covers most of the entire US Atlantic fishery, but is low in precision with highly variable landings from one year to the next. Best estimates of Atlantic marlin harvests, therefore, are derived through integration of both surveys in a way that adjusts for their respective weaknesses. It is important to note that application of both the "scalar expansion" and the "dual regression" techniques used in the above papers necessarily results in changes to the historical time series of harvests of each species. This transpires because performing both techniques as described in SCRS/2000/057 involves: (1) incorporating the most recent year's survey data in calculations (or regressions) that span the entire post-1981 time-series; and (2) applying the new relationships that emerge in (1) to the last 20+ years in the data set. Here, we provide estimates for 2002 that resulted after applying the scalar expansion technique on RBS/MRFSS ratios data pertaining to white marlin. Further methodolgical development is needed for blue marlin catch estimation. Several possible steps could be taken to limit revision of post-1981 landings with each new year of data, but discussion of these is beyond the scope of this report. Sailfish harvest estimates were revised in 2001 (SCRS/01/138). Confirmed landings from the three surveys (MRFSS, Headboat and TPW) were used to estimate average catch per trip for each stratum. The variability in estimated retention rates was reduced by applying the annual fraction of fish retained to estimates of the annual harvest. These estimates are considerably higher than the number of sailfish landings counted through the RBS since tournaments monitored by the RBS are known to represent only a small component of the recreational fleet that catches sailfish; therefore these estimates are thought to better reflect the magnitude of the total US Atlantic recreational sailfish harvest.

Given the considerations above, the preliminary estimates of 2002 U.S. recreational catches for these billfish species, combining the geographical areas of the Gulf of Mexico (Area 91), the northwestern Atlantic Ocean west of the 60° W longitude (Area 92), and the Caribbean Sea (Area 93) are: 17.1 MT for blue marlin, 5.6 MT for white marlin, and 103 MT for sailfish. The estimates for 2001 were 16.4 MT, 3.4 MT, and 61.7 MT, respectively, for the three species. The estimates of the U.S. recreational catch (landings) do not include any estimates of mortality of released (or tagged and released) fish. Table 2.4-BIL provides estimates of white marlin and sailfish landings using the estimation methods noted above. For blue marlin the estimates in Table 2.4-BIL represent RBS results and have not yet been adjusted for non-tournament fishing since the most appropriate estimation methodology is still under evaluation.

In addition to restrictions on U.S. recreational harvest, the Management Plan also imposed regulations on commercial fisheries by prohibiting retention and sale of the three species at U.S. ports. For this reason, no U.S. commercial landings were reported for any of the three Atlantic species. However, estimates of by-catch mortality in the U.S. longline fleet are made using the data from mandatory pelagic logbooks and scientific observer data collected on this fleet. The procedure for estimating the historical by-catch of blue marlin, white marlin, and sailfish was detailed in SCRS/96/97-Revised. This procedure was implemented for estimating by-catch mortalities from the U.S. longline

fleet.   Revisions to historical landings of billfish previously reported to ICCAT were based on review of the estimates conducted at the 1996 ICCAT Billfish Workshop held in Miami. Estimates of the billfish by-catch discarded dead in the U.S. commercial longline and other commercial fisheries for 2001 were 22.4 MT for blue marlin, 16.9MT for white marlin, and 10.8 MT for sailfish. The estimated 2002 U.S. discarded dead bycatch was 49 MT, 33 MT, and 7 MT, respectively for the three species. These estimates for 1999-2002 are also presented in Appendix Table 2.4-BIL.

2.1.5   Mackerels Fishery Statistics

Significant catches of king and Spanish mackerels by U.S. fishermen have occurred since the 1850's for Spanish mackerel and since the 1880's for king mackerel. The major gears currently exploiting these species are handlines and gillnets. Purse seines were also used to harvest king mackerel during the 1980's. Gillnets have historically been the main commercial gear for Spanish mackerel however in recent years, recreational removals have become an important component in total catches for both species. The majority of king mackerel catches are taken off North Carolina and Florida and it is believed that a major production area off Louisiana, is recovering. The primary Spanish mackerel catch areas include the Chesapeake Bay and Florida. Current fisheries are co-managed under the Coastal Migratory Pelagic Resources FMP enacted in 1983 and regulations adopted by the South Atlantic and Gulf of Mexico Fishery Management Council and implemented by NMFS.   Annual catches are monitored closely by NMFS and within season management measures include commercial trip limits, size limits, seasonal and area quotas, and recreational per person daily bag limits. Because these species occur in both federal and state territorial zones of the U.S., successful management has required participation by both federal and state management agencies. At present, none of the king or Spanish mackerel stocks are considered overfished.

Annual yields of king mackerel have ranged from 4,365 MT to 8,772 MT between 1983 and 2001 with an average production of about 7,000 MT since 1995. Annual catches of Spanish mackerel have ranged from 2,784 MT to 5,957 MT from 1983 to 2001 with the average catch of about 4,500 MT since 1995. Reported 2002 U.S. catches of king mackerel and spanish mackerel are preliminary and only include estimates for the period January-April and January-May, 2002, respectively. The reported landings of king mackerel and spanish mackerel were 2,344 mt and 1,061 MT, respectively. Harvest of both species has stabilized in recent years although large fluctuations in estimates of recreational catches in some years have occurred, and commercial and recreational landings have exceeded quotas in some years. The stabilizsion in yields is thought to be the direct impact of regulations which have been implemented in an effort to sustain future production. The primary management factors contributing to fluctuations in annual recreational harvests include difficulties of enforcement of differential bag limits imposed in individual states, large inter-annual variances in recreational harvest estimates, and regulations that permit the sale of king mackerel from recreational charter boats after the closure of commercial fisheries.

2.1.6 Shark Fishery Statistics

The U.S. Federal Fisheries Management Plan (FMP) for Atlantic sharks implemented in 1993 identified three management groups: large coastal sharks, small coastal sharks, and pelagic sharks. The pelagic complex included ten species: shortfin mako (*Isurus oxyrinchus*), longfin mako *(Isurus paucus)*, porbeagle (*Lamna nasus*), thresher (*Alopias vulpinus*), bigeye thresher (*Alopias superciliosus*), blue (*Prionace glauca*), oceanic whitetip (*Carcharhinus longimanus*), sevengill (*Heptranchias perlo*), sixgill (*Hexanchus griseus*), and bigeye sixgill (*Hexanchus vitulus*). The 1993 FMP classified the status of

pelagic sharks as unknown because no stock assessment had been conducted for this complex. The Maximum Sustainable Yield (MSY) for pelagic sharks was set at 1,560 mt dressed weight (dw), which was the 1986-1991 commercial landings average for this group. In 1997, as a result of indications that the abundance of Atlantic sharks had declined, commercial quotas for large coastal, small coastal, and pelagic sharks were reduced and the quota for pelagic sharks was set at 580 mt. In 1999, the U.S. FMP for Atlantic Tunas, Swordfish, and Sharks (NMFS 1999) proposed the following measures affecting pelagic sharks: (A) a reduction in the recreational bag limit to 1 Atlantic shark per vessel per trip, with a minimum size of 137 cm fork length for all sharks, (B) an increase in the annual commercial quota for pelagic sharks to 853 mt dw, apportioned between porbeagle (92 mt), blue sharks (273 mt dw), and other pelagic sharks (488 mt dw), with the pelagic shark quota being reduced by any overharvest in the blue shark quota, and (C) making the bigeye sixgill, sixgill, sevengill, bigeye thresher, and longfin mako sharks prohibited species that cannot be retained. All these regulations were implemented in 1999 and have been in effect since then.

The U.S. shark statistics reported to ICCAT (task 1) only include (1) landings by US longline fishermen with Atlantic swordfish and tuna permits and (2) estimates of dead discards of sharks from the US tuna and swordfish longline fishery. Additional catches and landings of Atlantic pelagic sharks are made by US fleets, including recreational fisheries. These total catches reported in Tables 2.6.a-2.6.c include all U.S. catches (although some of the data for 2002 are preliminary and subject to change) in anticipation of an assessment of pelagic sharks by ICCAT in 2004. Commercial landings (MT) of pelagic sharks steadily increased from the early 1980's, peaked in 1995, and have shown a declining trend since that year (Appendix Table 2.6a-SHK). Recreational landings in numbers estimated from the MRFSS survey during 1981-2002 peaked to a maximum of 93,000 fish in 1985, and showed a declining trend since that year, fluctuating between about 42,600 fish in 1986 to about 4,700 fish in 2002 (Appendix Table 2.6a-SHK). Pelagic longline dead discards also fluctuated between 1987 and 2002, with a minimum of about 3,500 fish in 1999 and a maximum of about 30,500 fish in 1993, but show a declining trend overall. Total catches ranged from about 12,500 fish in 1981 (no commercial landings or discard estimates were available for that year) to about 95,000 fish in 1985, as a result of the peak in recreational landings that year.

Blue shark (*Prionace glauca*) commercial landings were generally very low (Appendix Table 2.6b-SHK). Recreational landings in numbers ranged from about 500 fish in 1994 and 1995 to over 20,000 fish in 1987. Pelagic longline discards reached 29,000 fish in 1993, but otherwise oscillated between a minimum of about 2,800 fish in 1999 to a maximum of about 19,000 fish in 1996 (Appendix Table 2.6b-SHK). The trends in recreational landings and dead discards were very similar from 1992 to 1997. Total catches ranged from 0 fish in 1982 (a year in which no commercial or recreational landings were reported) to about 43,500 fish in 1993, the year in which dead discard estimates peaked (Appendix Table 2.6b-SHK).

Shortfin mako (*Isurus oxyrinchus*) commercial landings never exceeded 5,000 fish according to available estimates (Appendix Table 2.6c-SHK). Commercial landings from 1995 to 2002 in the quota monitoring and general canvass data collection programs are also assigned to an unclassified "mako" category, in addition to the "shortfin mako" category. Adding these landings of unclassified makos, which are likely to be shortfin makos, would increase commercial landings for this species, but would not affect significantly total catches. Most of the landings were attributable to the recreational fishery, whose landings in numbers peaked in 1985 to about 80,000 fish, and ranged from less than 1,400 fish to over 31,000 fish in the remaining years. Pelagic longline discards of shortfin makos were negligible. Total catches ranged from about 3,500 fish in 1999 to almost 82,000 fish in 1985, when recreational catches peaked (Appendix Table 2.6c-SHK).

Catches of other pelagic species, such as longfin mako (*Isurus paucus*), oceanic whitetip shark (*Carcharhinus longimanus*), porbeagle (*Lamna nasus*), bigeye thresher (*Alopias superciliosus*), and thresher shark (*Alopias vulpinus*) were very small. Only for thresher shark, did total landings exceed 1,000 fish for more than one year in a row.

2.2. Research Activities

Research continued on genetic identity of large pelagic fishes in the Atlantic, larval surveys for bluefin tuna and other large pelagics in the Gulf of Mexico, new methods for estimating and indexing abundance, robust estimation techniques for sequential population analyses, and estimating discards based on direct observations by scientific fishery observers. Research was also conducted on approaches for characterization of uncertainty in assessments and methods for translating that uncertainty into risk levels associated with alternative approaches. U.S. scientists also continued to coordinate efforts for the ICCAT Enhanced Research Program for Billfish and for the Bluefin Year Program. Collaborative research with scientists from ICCAT member nations and cooperating parties continues.

2.2.1 Bluefin Tuna Research

As part of its commitment to the Bluefin Program, research supported by the U.S. has concentrated on ichthyoplankton sampling, reproductive biology, methods to evaluate hypotheses about movement patterns, spawning area fidelity and stock structure investigations.

Ichthyoplankton surveys in the Gulf of Mexico during the bluefin spawning season were continued in 2002 and 2003. Data resulting from these surveys which began in 1977 are used to develop a fishery-independent abundance index of spawning west Atlantic bluefin tuna. This index has continued to provide one measure of bluefin abundance that is used in SCRS assessments of the status of the resource (SCRS/02/91). U.S. scientists participated in both the 2002 and 2003 Spanish TUNIBAL experiments to coordinate research approaches. W. J. Richards, J.T. Lamkin and D. Johnson are reviewing the distribution and abundance of larval bluefin tuna from the 20+ years of plankton tows (bongo and neuston) in the Gulf of Mexico in relation to oceanographic features. A report is planned for 2004.

Since 1998, researchers from Texas A & M University and the University of Maryland with assistance of researchers from Canada, Europe, and Japan have initiated studies on the feasibility of using otolith microconstituents to distinguish bluefin stocks. To date juveniles from both nursery area (W. Atlantic or Mediterranean) were separated with moderate success with classification rates ranging between 60 to 80% (see Appendix) using microconstituents. More recently research has focused on the use of $d^{13}C$ and of $d^{18}O$ isotopes in otoliths to distinguish nursery habitats. For juveniles collected in 1999 and 2000, $d^{18}O$ of Atlantic bluefin tuna collected in the Western Atlantic and Mediterranean were markedly different with no overlap between nurseries, and this difference was stable across the two years. Further, stable isotope values of otolith cores from medium and giant Atlantic tuna caught in the U.S. tended to delineate into either high or low $d^{18}O$ levels, indicative of origin in either the W. Atlantic or the Mediterranean. (see Appendix and SCRS/2003/105).

Scientists at Virginia Institute of Marine Science and Texas A&M University continue to search for heterogeneous micro-satellite loci. In addition they have begun screening adult bluefin from the east and western management areas for micro-satellite frequencies. Regional and temporal heterogeneity of allele frequencies have been found for several loci, but consistent differences between adults captured in the eastern and western Atlantic have not been found.

Bluefin larvae have been identified for possible use in genetic analyses. During the ichthyoplankton surveys in the Gulf of Mexico during the bluefin spawning season two neuston nets have been fished for at least a decade. Samples from one net have been preserved in ethanol so that the resulting specimens might be used for a variety of biological studies including genetic analyses and ageing. Most of those samples have now been sorted and are available for research on stock structure.

Research on bluefin tuna movement patterns using electronic tags, and on the associated methodology, was continued in 2002 and 2003. Scientists from (1) New England Aquarium, University of New Hamshire, N.M.F.S - Northeast Fisheries Science Center and D.F.O. from Canada and (2) Stanford University and the Monterey Bay Aquarium conducted these studies.

Scientists from the New England Aquarium and the University of New Hampshire conducted studies on a variety of topics related to bluefin tuna in addition to the tagging activities and the exploratory research in the central Atlantic in 2002. Data from pop-up satellite tags is being studied to determine the reliability of the geographic information for understanding bluefin movement and behavior. Studies of the relationship between bluefin schools and surface water temperatures have been conducted. Additionally research on the bluefin movement patterns and their relationship to the environment has been investigated with respect to the utility of spotter aircraft observations as indicators of abundance. Research is also continuing on bluefin energetics, reproduction and predator-prey relations (see Appendix).

Scientists from Stanford University and Monterey Bay Aquarium tagged 8 bluefin tuna in the Gulf of Mexico 2002 and continued tagging activities off North Carolina (releasing 123 with electronic tags in 2003). Double tagging experiments were conducted to estimate error rates in light based position estimates (see Appendix).

Several documents presented to the SCRS in 2002 considered the implications of mixing between Eastern and Western stocks. SCRS/02/93 examined recapture rates of tagged fish in three areas: 1) West Atlantic, 2) Northeast Central Atlantic, and 3) East Atlantic and Mediterranean. The use of the ICCAT tagging data for identifiying stock mixing in the Northeast Central area was discussed, as was the possibility of differing reporting rates between areas. SCRS/02/87 assumed a six strata spatial structure (as identified at the September 2001 ICCAT workshop on bluefin mixing) and applied a simple age-aggregated (production) model approach with inter-stratum mixing. The results suggested that, with or without mixing, the 1997 catch levels of bluefin in the western Atlantic are sustainable; however, those in the east for 1997 are well above sustainable levels and need substantial reduction. Across a wide range of model input parameter values, even at relatively modest levels of mixing, the fishery in the west was predicted to be adversely impacted unless reduction in the east takes place. In SCRS/02/88, a multi-area, fleet-disaggregated, age-structured population dynamics model was used to evaluate the effectiveness of existing and alternative management measures under different mixing scenarios. The model simulated the dynamics of the two bluefin tuna stocks in the North Atlantic and of the fisheries that target them. Results indicated that assessment estimates can be affected considerably by the level of mixing, age-specific movement patterns, and gear selectivities.

SCRS/02/86 identified some improvements for the ADAPT VPA assessment and projection computations carried out at the 2000 assessment, related to plus-group mass and how this was taken into account in MSY computations. Abundance indices were developed using Canadian fishery data (SCRS/02/81), U.S. longline data (SCRS/02/90) and U.S. rod and reel data (SCRS/02/89) for a range of size classes of bluefin tuna.

In response to the ICCAT Commission's request for options for alternative approaches for managing mixed populations of Atlantic bluefin several papers have been submitted to the SCRS. In 2002 SCRS/2002/087 and SCRS/2002/088 presented population models which examined the implications of detailed movement and assessment models on the perception of the status of the Atlantic management units. SCRS/2002/087 used lumped biomass production model approaches while SCRS/2002/088 used age structured approaches. S/2003/105 proposed the extension of the work described in SCRS/2002/088 to further simulate bluefin population patterns and to evaluate possible assessment and management scenarios; the proposed new models would incorporate Bayesian approaches to more fully model data inputs than is currently done by the SCRS with its conventional VPA analyses and to characterize the possible range of population estimates. SCRS/2003/106 further examined the age structured model used in SCRS/2002/088 particularly with respect to its ability to replicate conventional one stock VPA estimates of resource status estimated by the 2002 SCRS and concluded that the western patterns could be replicated but the increasing recruitment pattern for the eastern management unit could not be replicated (also see appendix). SCRS/2003/108 also examined approaches to developing more complex models of bluefin population dynamics including detailed spatial information and methods for assessing the resources and examining management procedures.

Most sampling of tissues from bluefin tuna during 2002 and 2003 has been conducted by scientists associated with the University of Maryland, Texas A&M University, the University of New Hampshire, and the New England Aquarium. Scientists from the University of Maryland and Texas A&M University collected samples from 51 bluefin of about 100-150 cm from the western Atlantic in 2002 as well as samples of juveniles from the Mediterranean Sea in cooperation with European colleagues. Scientists from the University of New Hampshire/New England Aquarium obtained samples from 30 bluefin during 2003. The National Oceanographic and Atmospheric Administration laboratory in Charleston, S.C. is acting as a sample archive center and in 2003 received extensive sub-samples of muscle, blood and gonads from the Icelandic sampling of the Japanese longline catches in Icelandic waters in 1996-2002. The National Marine Fisheries Service observers obtained muscle, blood and gonad samples from seven mature bluefin from the Gulf of Mexico in 2002 and one mature bluefin in 2003. Tables of the mumbers of fish samples available at the western bluefin archive through mid 2002 are available in 2002 National Report.

2.2.2 Swordfish Research

Data from observer samples were compared against self-reported information in from the U.S. large pelagic mandatory logbook reporting system and estimates of discard mortality of swordfish, billfish, sharks and other species from the U.S. fleet were developed from that analysis for the 2003 SCRS. Estimates of small swordfish bycatch for 2002 were compared to the average levels estimated for the late 1990's and were found to be substantially lower (see Appendix).

Fisher reported and observed swordfish catch, size and catch rate patterns through 2002 were examined in support of monitoring the recovery of north Atlantic swordfish. Standardized indices of abundance were updated for the Western North Atlantic using data from the U.S. pelagic longline fleet (SCRS/03/109).

Collaborative research with Venezuelan scientists continues on estimating the age-structure of the catch of swordfish. Results of this research will be available for the next assessment of north Atlantic swordfish.

Samples of more than 40 male swordfish gonads have been collected for European scientists.

Research on measures to mitigate the interactions between pelagic longline and bycatch of marine turtles continued in 2002-2003 under a cooperative research program involving the US Atlantic pelagic longline fishery. Thus far, testing of five potential bycatch reduction techniques during 687 research sets on the Grand Banks has indicated that longline fishermen can avoid unintentional catches of loggerhead sea turtles by reducing the time their hooks are in the water during daylight hours. The results also indicate important sea turtle bycatch reduction can be achieved by using circle hooks instead of the J hook historically used in the fishery, and by using mackerel for bait rather than squid, the primary bait used in the fishery. The vessels participating in the experimental fishing effort reduced loggerhead sea turtle interaction by 92 percent using circle hooks with mackerel bait while actually increasing swordfish catch rates over J hooks with squid bait used as control effort. The gear and techniques developed by this program are being tested in research programs in several countries, and results of this research are being used in other fisheries and countries that operate longline gear. A report on the research progress for this program can be found at http://www.mslabs.noaa.gov/mslabs/docs/watson2.pdf .

2.2.3 Yellowfin Tuna Research

Several collaborative studies were conducted by U.S. scientists in cooperation with scientists from other countries. Cooperative research by the U.S. NMFS and the INP in Mexico continued and resulted in a joint analysis of US and Mexican longline CPUE of yellowfin in the Gulf of Mexico (SCRS/03/061). Cooperative research plans include further development of abundance indices for sharks and other tunas, as well as the refinement of the yellowfin tuna indices as additional data becomes available. Cooperative research on yellowfin tuna abundance indices, catch at age, and life-history studies is also continuing with Venezuelan scientists. One document on Venezuelan longline catch rate patterns resulted from this collaboration in 2003 (SCRS/03/054) and additional working papers based on this collaboration are expected in future years.

Several other working papers were provided in support of the 2003 stock assessment of YFT (July, Merida, Mexico). Two relative abundance patterns (one for the Gulf of Mexico and another for the Atlantic regions fished by US longline vessels) based on US pelagic longline data from 1981 to 2002 were presented in SCRS/03/060. Additionally, a relative abundance index based on data collected through the Large Pelagic Survey from the Virginia-Massachussetts rod&reel fishery (1986-2002) was presented in SCRS/03/062.

New information from a genetic study was presented in SCRS/03/063. The phylogenetic analysis conducted on samples from the Gulf of Mexico and Gulf of Guinea by researchers at Texas A&M, Galveston, revealed the presence of siblings in several sampling tows for juvenile tuna. Given the high level of genetic diversity at both the mitochondrial and microsatellite loci, the probability of such sampling is extremely low and can best be explained by the unequal reproductive output of certain females. Increases in vulnerability of juvenile YFT could be of concern in terms of genetic integrity of the population if levels of reproductive variance are confirmed to be large.

2.2.4 Albacore Research

In 2003, an analysis of U.S. longline CPUE (SCRS/03/086) was prepared in support of the ICCAT assessment of northern- and southern- Atlantic albacore.

2.2.5 Mackerels and Small Tunas Research

U.S. small tuna research is directed mainly on king and Spanish mackerel stocks as the amount landed of other small tunas such as cero makerels by U.S. fishermen is very low. The focus of research is

collection of primary fishery catch statistics, and biostatistical sample data, fishery age samples, and abundance indices. Critical research areas regarding mackerels relate to the adequacy of sampling of the age structure of the stocks, the amount of mixing between management units, and increasing the precision associated with the mackerel assessment abundance indices. Because assessment and management are by necessity by geographical units, continued research on migration of king mackerel in particular is important.

2.2.6   Shark Research

Research on Atlantic pelagic sharks continued to be conducted in support of the Fishery Management Plan for Atlantic Tunas, Swordfish and Sharks, and ICCAT. Two NMFS scientists were invited to attend a North Atlantic blue shark Discussion Meeting organized by the Irish Marine Institute in Dublin, Ireland, in January 24-25, 2002. The objectives of the meeting were to further cooperation between ICES (International Council for the Exploration of the Seas) and ICCAT, on the assessment of pelagic sharks in the north Atlantic, as well as enhancing the links between researchers and institutes involved in pelagic shark assessment in the region. The meeting was a result of the EC-funded initiative DELASS (Developing Elasmobranch Assessments), an international research project aimed at improving the scientific basis for the management of fisheries taking elasmobranchs in Europe. Items reviewed and discussed at the meeting included information on the biology of Atlantic pelagic sharks, with emphasis on the blue shark, existing analyses and further work on blue shark stock status, cooperation between ICES and ICCAT on future assessment work of pelagic sharks, data availability, a possible assessment of blue shark by ICES in 2002, and future research directions and collaborative work.

After the meeting, a spreadsheet for calculating population parameters of blue sharks under uncertainty using a life-table approach was made available by NMFS scientists for use in the ensuing ICES Study Group on Elasmobranch Fishes stock assessment meeting held in Copenhagen, Denmark, in May 24-25, 2002. ICCAT is planning an assessment of pelagic sharks in 2004.

2.2.7   Billfish Research

Sampling of recreational billfish tournaments continued in 2002 along the U.S. east coast, Gulf of Mexico, Bahamas, and U.S. territories in the Caribbean. A total of 175 billfish tournaments were sampled in 2002, compared to 177 tournaments in 2001. This represented 134,525 hours of fishing effort, an increase of about 7,058 hours from the 2001 level. In 2002, tournament sampling accounted for 137 billfish boated (83 blue marlin, 33 white marlin, 14 sailfish, 0 spearfish and 7 swordfish) and 6,171 released. In comparison, in 2001, there were 108 billfish boated (75 blue marlin, 22 white marlin, 111 sailfish, and 0 spearfish) and 5,563 released.

A number of working papers on various aspects of marlin research were submitted to ICCAT. Document SCRS/2003/030 addresses modeling biases and contradictions among catch rate indices of abundance for Atlantic white marlin (*Tetrapterus albidus*). The paper presents a Bayesian surplus production model (with sensitivity analyses) in which q is adjusted through the latter part of the time series for some commercial fisheries, including the Japanese longline fishery. Document SCRS/2003/031 presents a computer simulation model designed to simulate many forms of fisheries data routinely collected from real fisheries. Up to 10 simultaneous fisheries on the population may be modeled, and each may have minimum and maximum vulnerable sizes and discard mortality rates. The program suite includes modules to compute equilibrium production, maximum sustainable yield, and yield per recruit for the overall selectivity pattern in any simulated year. Document SCRS/2003/032 describes a computer simulation model, SEEPA (Simulator for Evaluating the use of Environmental constraints for standardizing Population Abundance indices), designed to simulate longline catch-effort data. It allows an examination of the consequences of making wrong assumptions about the actual

distributions of the fish and the gear in the habitat-standardization process. Document SCRS/2003/033 describes habitat preferences and diving behavior (as determined using electronic tags) of white marlin (*Tetrapturus albidus*) released from the commercial longline and recreational troll fisheries in the western North Atlantic Ocean. Implications for habitat-based stock assessment models are also discussed. Document SCRS/2003/104 describes modifications made to the computer simulation model, SEEPA. Differences between the distributions resulting from the current simulations and previous analyses with SEEPA are briefly discussed. Document SCRS/2003/025 summarizes research activities of the ICCAT Enhanced Research Program for Billfish in the Western Atlantic Ocean during 2003 by location and research objective.

The NMFS SEFSC again played a substantial role in the ICCAT Enhanced Research Program for Billfish in 2002, with SEFSC scientists acting as general coordinator and coordinator for the western Atlantic Ocean. Major accomplishments in 2002 were documented in SCRS/02/127.   Highlights include 19 at-sea sampling trips with observers on Venezuelan industrial longline vessels in through September, 2002. Of the trips accomplished to date, 4 observer trips were on Korean type vessels fishing under the Venezuelan flag. Most of these vessels are based out of Cumana targeting tuna, swordfish, or both at the same time. Biological sampling of swordfish, Istiophorids, and yellowfin tuna for reproductive and age determination studies, as well as genetics research were continued during the 2002 sampling season. Shore-based sampling of billfish landings for size frequency data, as well as tournament sampling were obtained from Venezuela, Grenada, U.S. Virgin Islands, Bermuda, Barbados, and Turks and Caicos Islands. Program participants in Venezuela, Grenada, and Barbados continued to assist in obtaining information on tag-recaptured billfish, as well as numerous sharks, in the Western Atlantic Ocean during 2002--a total of 35 tag recovered billfish and sharks were submitted to the Program Coordinator in 2002 and 16 were submitted during the last quarter of 2001. Age, growth, and reproductive samples from several very large billfish were obtained during 2002

In 2002, further investigations of biological habitat requirements and post release survival of blue and white marlins were conducted using popup satellite archival tags (PSAT) facilitated through cooperative research with the US pelagic longline vessels and with the US for-hire fleets operating in areas of high concentrations of billfish. To date, 25 blue marlin have be released with PSATs programed for 30 & 40 day deployments from recreational vessels in the Caribbean and 6 from commercial platforms in the South Atlantic off Florida. In addition, 22 white marlin were tagged with short term deployments (5-10 days) PSATs from recreational vessels near the southeastern tip of the Dominican Republic, and along the US Mid-Atlantic coast and off Venezuela to evaluate post-release survival. In addition, 6 white marlin were tagged with short term PSAT deployments from commercial longline platforms off South Florida.   This research is critical for evaluation of post release survival and essential fish habitat since for pelagic species in general, and for marlins in particular the information base is almost non-existent. Data from these fish are currently being compiled and analyzed.

2.2.8 Tagging

Participants in the Southeast Fisheries Science Center's Cooperative Tagging Center (CTC) and the Billfish Foundation Tagging Program (TBF) tagged and released 8,489 billfishes (including swordfish) and 664 tunas in 2002. This represents an increase of about 9% for billfish and an increase of 33.9% for tunas from 2001 levels. A number of electronic tagging studies involving bluefin tuna and billfish were also carried out in 2002. These are discussed in the bluefin and billfish research sections above.

There were 118 billfish recaptures from the CTC and TBF reported in 2002, representing a decrease of 11.9% from 2001. Among the 2002 CTC billfish recaptures there were 39 blue marlin, 25 white marlin, 50 sailfish, and 4 swordfish. For the CTC and TBF, a total of 37 tunas were recorded

recaptured in 2001; these were 28 bluefin and 9 yellowfin tuna. These recaptures represent a 37% decrease with respect to year 2001 values. The ICCAT Enhanced Research Program for Billfish in the western Atlantic Ocean has continued to assist in reporting tag recaptures to improve the quantity and quality of tag recapture reports, particularly from Venezuela, Barbados and Grenada.

2.2.9 Fishery Observer Deployments

Domestic Longline Observer Coverage. In accordance with ICCAT recommendations, randomized observer sampling of the U.S. large pelagic long line fleet was continued into 2002 (see Appendix Figure 2.2-Observers). Representative scientific observer sampling of this fleet has been underway since 1992. The data collected through this program have been used to quantify the composition, disposition, and quantity of the total catch (both retained and discarded at sea) by this fleet which fishes in waters of the northwest Atlantic Ocean, Gulf of Mexico, and the Caribbean Sea. Selection of the vessels is based on a random, 5% sampling of the number of sets reported by the longline fleet. A total of 5,232 sets (3,698,265 hooks) were recorded observed by personnel from the SEFSC and NEFSC programs from May of 1992 to December of 2002. Observers recorded over 301,343 fish (primarily swordfish, tunas, and sharks), marine mammals, turtles, and seabirds during this time period. Observer coverage successfully recorded effort from 329 observed sets during 1992, 817 during 1993, 648 during 1994, 699 during 1995, 361 during 1996, 455 during 1997, 287 during 1998, 430 during 1999, 465 during 2000, 395 during 2001, and 346 during 2002 corresponding to nominal sampling fractions of about 2.5%, 6%, 5.2%, 5.2%, 2.5%, 3.1%, 2.9% , 4% , 4%, 4%, and 4%. Starting in year 2002, the sampling fraction was increased to about 8% of the longline fleet. Document SCRS/02/126 provides a more detailed summary of the data resulting from observer sampling between 1992 and 2000.

Southeast U.S. Shark Drift Gillnet Fishery Observer Coverage. The directed shark drift gillnet Observer Program operated by the SEFSC at the Panama City (FL) Laboratory began in 1993 to meet the mandates of the Atlantic Large Whale Take Reduction Plan. Observer coverage varied from 3.2 to 26.8% yr^{-1} from 1993-1995. No coverage was provided in 1996 and 1997, but in 1998 an observer program was partially funded to meet requirements of a NMFS Biological Opinion relating to right whales and sea turtles. Continued coverage ranging from 100%, required during the Right Whale Calving season (15 Nov-1 Apr), to 30-53% has been established since 1999. A total of 322 sets of the shark drift gillnet fishery were observed during 1999-2002. Effort took place in waters off of south Georgia, as well as central and south Florida.

Foreign Fishery Observers. There was no foreign fishing directed at large pelagic species in the U.S. Exclusive Economic Zone (EEZ) off the east coast during 2002.

3. U.S. Implementation of ICCAT Conservation and Management Measures

3.1 Catch Limits and Minimum Sizes

Rebuilding Program for West Atlantic Bluefin Tuna (Rec 98-7; 02-07)
The 1998 rebuilding program for west Atlantic bluefin tuna established an annual landings quota for the United States of 1387 mt. This quota is applied to the 2002 fishing year of June 1, 2002 - May 31, 2003. During the 2001 fishing year, the United States landed 1589 mt dw bluefin tuna, including 82.99 mt dw of bluefin tuna less than 115 cm and 41.43 mt of dead discards. The underharvest of 249 mt from 2001 was carried over to adjust the 2002 fishing year quota. In 2002, the United States landed an estimated 1874 mt dw (all 2002 fishing year estimates were calculated using 2001 fishing year data for the second half of the 2002 fishing year), including 169.66 mt of bluefin tuna less than 115 cm and 38 mt of dead discards (see Appendix, page 1).

Recommendation 02-07 revised the annual landings quota for the United States to 1489.6 mt and allocated 25 mt to pelagic longline catches within the vicinity of the management boundary area. This quota is applied to the 2003 fishing year of June 1, 2003 - May 31, 2004.

Recommendation to Establish a Plan to Rebuild Blue Marlin and White Marlin Populations (Rec 00-13; 02-13)
Phase I requires that countries capturing marlins commercially reduce white marlin landings from pelagic longline and purse seine fisheries by 67 percent and blue marlin landings by 50 percent from 1999 levels; the United States has prohibited all commercial retention of billfish since 1988. For its part of the rebuilding program, the United States agreed to maintain regulations that prohibit all landings of marlins by U.S. pelagic longline fishermen, and to continue monitoring billfish tournaments through scientific observer coverage of at least 5 percent initially, with an objective of 10 percent coverage by 2002. The United States now exceeds these observer requirements. The United States also agreed to limit annual landings by U.S. recreational fishermen to 250 Atlantic blue and white marlin, combined, per year, through 2005. Recommendation 02-13 extended the blue and white marlin rebuilding plan through 2005 and the time frames of the next stock assessments. Catch and release rates are estimated to be very high (90-95%) based on tournament data, and minimum sizes have been established at 168 cm (66 inches) for white marlin and 251 cm (99 inches) for blue marlin. While data indicate that the United States' landings have been under the 250 marlin limit, the United States is in rulemaking to codify the limit as well as implement compliance mechanisms to ensure that the limit is not exceeded.

Recommendation to Establish a Rebuilding Program for North Atlantic Swordfish (Rec 99-7; 02-02)
The 1999 recommendation established an annual landings quota of 2951 mt ww for the United States. Recommendation 02-02 established new quotas for the United States for 2003-2005, a dead discard allowance of 80 mt for 2003, a provision allowing up to 200 mt of North Atlantic swordfish to be caught between 5 degrees North latitude and 5 degrees South latitude, and a provision to transfer 25 mt to Canada. The landings quota and discard allowance are applied to a fishing year of June 1 - May 31. During the 2001 fishing year, there was an underharvest of 1437 mt ww. This underharvest was added to the landings quota for the 2002 fishing year. Landings and discard estimates for the 2002 fishing year are provided in the U.S. compliance tables (see Appendix, page 4). The United States has a minimum size of 33 lb (15 kg) dressed weight, which is designed to correspond to 119 cm, with zero tolerance. Information on compliance with the minimum size is provided in the U.S. compliance tables. The United States is in rulemaking to establish the provisions from Recommendation 02-02.

Recommendation Concerning Swordfish Catches by the Tuna Longline Fishery (00-03)
The United States established a 400 mt ww reserve from the 2001 fishing year quota for North Atlantic swordfish to account for higher than anticipated discards by Japan. At the 2002 meeting, Japan indicated that a total of 215 mt ww were discarded and the United States transferred that amount of quota to Japan in the 2002 fishing season year management period.

Recommendation on South Atlantic Swordfish (02-03)
This recommendation establishes catch limits for the United States for 2003-2006 at 100 mt for 2003 through 2005 and 120 mt for 2006 and allowed that underharvests in 2000 may be carried over to 2003. The United States is in the final stages of rulemaking to establish these provisions. The United States landed 69.86 mt dw in fishing year 2001 and an estimated 53.17 mt dw in fishing year 2002.

Recommendation on Revision and Sharing of the Southern Albacore Catch Limit (02-06)
The United States is subject to a catch limit of 100 mt in 2003, but does not have a directed fishery for southern albacore. The United States landed 2 mt dw in calendar year 2001.

Recommendation on North Atlantic Albacore Catch Limits (02-05)

The United States was allocated a landings quota of 607 mt ww for 2003, which is a level consistent with average landings for the United States over the past ten years. This recommendation applies for one year only. Given the minor share of U.S. mortality in this fishery (< 2%), and given that the ICCAT recommendation provides for the adjustment of next year's catch level in the case of overharvest or underharvest, no new regulations have been proposed for this fishery in the United States. The recommendation provides that overages/underages of this annual catch limit should be deducted from or added to the catch limit established for the year 2004 and/or 2005. The United States landed 453 mt dw in fishing year 2001 and an estimated 498 mt dw in fishing year 2002.

In addition, pursuant to ICCAT's recommendation concerning the limitation of fishing capacity on North Atlantic albacore (1998), the United States submits annually the required reports providing a list of U.S. vessels operating in the fishery.

Recommendation on Bigeye Tuna Conservation Measures (02-01)
No catch limits apply to the United States, since 1999 catch was less than 2100 mt. The United States has implemented a higher minimum size than that required by ICCAT, which provides additional protection for juvenile bigeye. This minimum size of 27 inches (approximately 6.8 kg) applies to all U.S. fisheries landing bigeye tuna, both commercial and recreational. The United States landed 1363 mt dw in fishing year 2001 and an estimated 507 mt dw in fishing year 2002, with no landings of bigeye tuna less than 3.2 kg for both years.

Resolution on Atlantic Sharks (2001)
This resolution calls for the submission of catch and effort data for porbeagle, shortfin mako, and blue sharks; encourages the release of live sharks to the extent possible; encourages the minimization of waste and discards in accordance with the Code of Conduct for Responsible Fisheries; and calls for voluntary agreements not to increase fishing targeting Atlantic porbeagle, shortfin mako, and blue sharks until an assessment can be conducted. The United States already submits catch and effort data for sharks and has catch limits in place for Atlantic porbeagle, shortfin mako, and blue sharks. In 2002, pursuant to the 2000 Shark Finning Prohibition Act, the United States banned the practice of finning nationwide (67 FR 6194, February 11, 2002), which will reduce waste associated with finning. Additionally, the United States adopted a National Plan of Action for the Conservation and Management of Sharks in February 2001, consistent with the International Plan of Action for Sharks, which calls for management measures to reduce waste to the extent practicable and to protect vulnerable life history stages, such as juveniles. The United States is in rulemaking to revise Atlantic shark management measures consistent with new stock assessments.

3.2 Closed Seasons

Recommendation on the Establishment of a Closed Area/Season for the Use of Fish-Aggregation Devices (Rec 99-3)
No U.S. action is necessary for this measure. The United States does not have any surface fleets fishing in the area covered by this recommendation.

Domestic Time/Area Closures for ICCAT Species
At present, the Atlantic pelagic longline fishery of the United States is subject to several discrete time/area closures that are designed to reduce bycatch in the pelagic longline fishery by prohibiting pelagic longline fishing for ICCAT species in those areas during specified times. These closures affect offshore fishing areas up to 200 nautical miles (nm) from shore (see Figure 1). Those closures are as follows: (1) Florida East Coast: 50,720 nm^2 year-round; (2) Charleston Bump: 49,090 nm^2 from February through April each year; (3) DeSoto Canyon: 32,860 nm^2 year-round; (4) the Northeastern United States:

21,600 nm^2 during the month of June each year; and (5) Northeast Distant Statistical Sampling Area (NED): 2,631,000 nm^2 year-round. 50 CFR 635.21(c)(2).

NMFS is conducting a 3-year experimental fishery in the NED closed area to develop sea turtle bycatch reduction measures with the intention of reopening the NED closed area and exporting the measures to international fishing fleets. The third year of the experiment is underway.